

Civil / Structural Engineering Topical Area Study Index

Section 1 Civil / Structural Engineering Qualification Standard

- 1.6 Civil / structural engineering personnel shall demonstrate a working level knowledge of applying the principles of force to stationary or moving objects.
- 1.7 Civil / structural engineering personnel shall demonstrate a working level knowledge of the basic principles and concepts of geotechnical science.
- 1.8 Civil / structural engineering personnel shall demonstrate a working level knowledge of the basic principles and concepts of hydrology.
- 1.9 Civil / structural engineering personnel shall demonstrate a working level knowledge of the basic principles and concepts of geology.
- 1.10 Civil / structural engineering personnel shall demonstrate a working level knowledge of the Department design and construction processes.
- 1.11 Civil / structural engineering personnel shall demonstrate a working level knowledge of the principles associated with surveying, grading, drainage and paving.
- 1.12 Civil / structural engineering personnel shall demonstrate a working level knowledge of the principles and concepts of structural analysis.
- 1.13 Civil / structural engineering personnel shall demonstrate a working level knowledge of the fundamentals of reinforced concrete design.
- 1.14 Civil / structural engineering personnel shall demonstrate a working level knowledge of the principles of structural steel design.
- 1.15 Civil / structural engineering personnel shall demonstrate a working level knowledge of the principles and characteristics of natural phenomena as related to structures.
- 1.16 Civil / structural engineering personnel shall demonstrate a working level knowledge of seismic analysis fundamentals.
- 1.19 Civil / structural engineering personnel shall demonstrate the ability to analyze potable and waste water treatment systems.
- 1.20 Civil / structural engineering personnel shall demonstrate a familiarity level knowledge of the various computer applications used in civil engineering.
- 1.21 Civil / structural engineering personnel shall demonstrate the ability to use civil engineering plans and drawings.
- 2.1 Civil / structural engineering personnel shall demonstrate a working level knowledge of the civil / structural engineering-related sections and/or requirements of the following related Department of Energy (DOE) Orders:

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- DOE Order 5480.28, Natural Phenomena Hazards Mitigation
 - DOE Order 6430.1A, General Design Criteria, Section B, Uniform Building Code (UBC)
- 2.2 Civil / structural engineering personnel shall demonstrate the ability to determine the adequacy of local compliance with the civil / structural engineering-related sections and / or requirements of the following Department of Energy (DOE) Orders:
- DOE Order 5480.28, Natural Phenomena Hazards Mitigation
 - DOE Order 6430.1A, General Design Criteria, Section B, Uniform Building Code (UBC)
- 2.3 Civil / structural engineering personnel shall demonstrate a working level knowledge of the following civil /structural engineering-related Department of Energy (DOE) Technical Standards:
- DOE-STD-1020-94, Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities
 - DOE-STD-1021-93, Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components
 - DOE-STD-1022-94, Natural Phenomena Hazards Site-Characterization Criteria
 - DOE-STD-1024-92, Guidelines for Use of Probabilistic Seismic Hazards Curves at DOE Sites
- 2.4 Civil / structural engineering personnel shall demonstrate the ability to evaluate the adequacy of local compliance with the following civil / structural engineering-related Department of Energy (DOE) Technical Standards:
- DOE-STD-1020-94, Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities
 - DOE-STD-1021-93, Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components
 - DOE-STD-1022-94, Natural Phenomena Hazards Site-Characterization Criteria
 - DOE-STD-1024-92, Guidelines for Use of Probabilistic Seismic Hazards Curves at DOE Sites
- 2.6 Civil / structural engineering personnel shall demonstrate a familiarity level knowledge of the architectural engineering requirements outlined in the following documents as applicable to the review of design specifications for Department of Energy (DOE) facilities:
- Americans with Disabilities Act (ADA);
 - General Services Administration (GSA) Space Requirements; and
 - Life Safety Codes
- 4.6 Civil / structural engineering personnel shall demonstrate the ability to act as the Department 's subject matter experts for civil / structural engineering activities by routinely interacting with Federal, State, local and public stakeholder representatives during the oversight and management of civil / structural engineering programs.

Section 2 Construction Management & Engineering Qualification Standard

- 1.11 Construction management and engineering personnel shall demonstrate a familiarity level knowledge of the principles and concepts of natural phenomena hazards.
- 1.17 Construction management and engineering personnel shall demonstrate a familiarity level knowledge of the basic concepts of hydrology.
- 2.5 Construction management and engineering personnel shall demonstrate a familiarity level knowledge of the following Department of Energy Technical Standards and Order related to natural phenomena hazards:
- DOE-STD-1020-94, Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities
 - DOE-STD-1021-93, Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems and Components
 - DOE-STD-1022-94, Natural Phenomena Hazards Site Characterization Criteria
 - DOE Order 5480.28, Natural Phenomena Hazards Mitigation

Section 3 Environmental Compliance Qualification Standard

- 1.8 Environmental compliance personnel shall demonstrate a familiarity level knowledge to force to geophysical properties.
- 1.9 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the principles and concepts of soil science.
- 1.10 Environmental compliance personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of hydrology.
- 1.11 Environmental compliance personnel shall demonstrate a familiar level knowledge of the basic principles and concepts of geology.

Section 4 Environmental Restoration Qualification Standard

- 1.7 Environmental restoration personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of soil science.
- 1.8 Environmental restoration personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of hydrology.
- 1.9 Environmental restoration personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of geology.
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- 1.11 Environmental restoration personnel shall demonstrate a familiarity level knowledge of engineering design, and reading and interpreting of engineering and architectural drawings.

Section 5 Instrumentation and Control Qualification Standard

- 1.18 Instrumentation and control personnel shall demonstrate a familiarity level knowledge of the geoseismic / civil engineering theories, principles, and techniques that apply to instrumentation and control systems.
- 1.22 Instrumentation and control personnel shall demonstrate the ability to read and interpret engineering fabrication, construction, and architectural drawings.

Section 6 Electrical Systems Qualification Standard

- 1.13 Electrical systems personnel shall demonstrate a familiarity level knowledge of the principles and concepts of natural phenomena hazards and their effect on electrical systems.
- 2.9 Electrical systems personnel shall demonstrate a familiarity level knowledge of the following Department of Energy Standards and Order related to natural phenomena hazards:
- DOE-STD-1020-94, Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities
 - DOE-STD-1021-93, Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems and Components.
 - DOE-STD-1022-94, Natural Phenomena Hazards Site Characterization Criteria
 - DOE Order 5480.28, Natural Phenomena Hazards Mitigation

Section 7 Mechanical Systems Qualification Standard

- 1.28 Mechanical systems personnel shall demonstrate a familiarity level knowledge of the principles and concepts of natural phenomena hazards and their effect on mechanical systems.
- 2.7 Mechanical systems personnel shall demonstrate a familiarity level knowledge of the following Department of Energy (DOE) Standards and the Order related to natural phenomena hazards:

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- DOE-STD-1020-94, Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities
 - DOE-STD-1021-93, Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components
 - DOE-STD-1022-94, Natural Phenomena Hazards Site Characterization Criteria
 - DOE Order 5480.28, Natural Phenomena Hazards Mitigation

Section 8 Facility Maintenance Management Qualification Standard

- 1.37 Facility maintenance management personnel shall demonstrate a familiarity level knowledge of the principles and concepts of natural phenomena hazards and their effect on systems and structures.
- 2.12 Facility maintenance management personnel shall demonstrate a familiarity level knowledge of the following Department of Energy Technical Standards and Order related to natural phenomena hazards:
- DOE-STD-1020.94, Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities
 - DOE-STD-1021-93, Natural Phenomena Hazards Site Characterization Criteria
 - DOE-STD-1022-94, Natural Phenomena Hazards Site Characterization Criteria
 - DOE Order 5480.28, Natural Phenomena Hazards Mitigation

Section 9 Chemical Processing Systems Qualification Standard

- 1.14 Chemical processing personnel shall demonstrate a familiarity level of knowledge of the principles and concepts of natural phenomena hazards and their effect on chemical processing systems.
- 2.7 Chemical processing personnel shall demonstrate a familiarity level knowledge of the following Department of Energy (DOE) Standards and the Order related to natural phenomena hazards:
- DOE-STD-1020-94, Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities
 - DOE-STD-1021-93, Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and components
 - DOE-STD-1022-94, Natural Phenomena Hazards Site Characterization Criteria
 - DOE Order 5480.28, Natural Phenomena Hazards Mitigation

Section 10 Project Management Qualification Standard

- 1.3 Project management personnel shall demonstrate a familiarity level of knowledge of the application of the civil engineering theories, principles and techniques.
- 1.4 Project management personnel shall demonstrate the ability to read and interpret engineering fabrication, construction, and architectural drawings.
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